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# New Research Uncovers Factors Aggravating The Impact Of Economic Downturns In Nation's Top High-Technology Areas

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**Editors:** Ross Gittell and Jeff Sohl are available to discuss the results of their research about technology centers. Gittell can be reached at 603-862-3340 (w), 603-431-7628 (h) or [ross.gittell@unh.edu](mailto:ross.gittell@unh.edu). Sohl can be reached at 603-862-3373 (w) or [jeff.sohl@unh.edu](mailto:jeff.sohl@unh.edu).

DURHAM, N.H. – When the tech boom of the 1990s turned into the tech bust of 2000, some high technology areas in the United States fared worse than others. In new report, two researchers at the University of New Hampshire Whittemore School of Business and Economics report that several key factors caused some high-tech areas, such as California's Silicon Valley, to feel the economic pain more substantially than other areas.

Ross Gittell, James R. Carter Professor and professor of management, and Jeffrey Sohl, director of the Center for Venture Research and professor of entrepreneurship and decisions sciences, authored "Technology Centres During The Economic Downturn: What Have We Learned?", which was published in the British journal *Entrepreneurship & Regional Development*, in July 2005. The article assesses the economic performance of metropolitan technology centers in the United States during the business downturn of the early 2000s.

"There are significant challenges ahead for technology centers in the USA and elsewhere. For regions, economic advantage – even with knowledge-based industry concentrations and strong existing business networks – is a dynamic concept, not a static position. The main challenges ahead for technology centers and all regional economies is how to nurture and sustain economic vitality. The experience of the late 1990s in the U.S. tech centers suggest that continued change, diversification, adjustment and renewal will be necessary in the 21st century for regional economies, as it was for regions in the 20th and 19th centuries," the researchers said.

Among the key findings, the researchers report:

- Venture capital investment levels negatively correlate with percentage change in employment, suggesting that there can be "too much of a good thing" in terms of money available for start-up and high growth ventures during economic upswings.
- Technology centers with the highest concentrations of high-tech employment were most adversely affected by economic downturns.
- Diversification within high technology can be beneficial.
- Metropolitan areas with high concentrations in the information industry suffered more in

the recent recession.

- Policies that raise overall wages in technology centers can contribute to pronounced employment decline during economic downturns.
- Entrepreneurship may not be significant in mitigating economic decline in technology centers, but may be one of the major factors in contributing to economic recovery.

The researchers looked at “tech poles,” which refers to the 25 top-ranked metropolitan statistical areas (MSAs) in the nation in terms of high-technology industry output and concentration as defined by the Milken Institute. The 25 were chosen from 287 metropolitan areas.

Six tech poles – San Jose (1), San Francisco (22), Seattle (5), Boston (4), New York City (9), and Dallas (2) – had sharp employment declines, all with more than double the U.S. average decline and all ranked among the bottom performing 10 percent (24 out of 287) of MSAs in the nation. Only 4 of the 25 tech poles experienced employment growth during 2001 to 2003.

The researchers found there were five key variables that helped explain what occurred regarding tech pole employment from March 2001 to March 2003: venture capital per worker, high-technology employment concentration, diversity in high-technology employment, information industry concentration and average (all industry) wages.

### **Venture Capital Per Worker**

“Venture capital investment levels are negatively correlated with percentage change in employment. This might reflect that too much capital was chasing too few sound business ventures in ‘hot markets’ at the end of the exuberant 1990s. This also suggests that local compact networks among venture capitalists and aspiring entrepreneurs might have detrimental aspects, fostering hype, speculation and non-prudent investment especially in the tail end of economic growth periods such as the late 1990s,” the researchers said.

### **High-Technology Employment Concentration**

With the so-called “burst of the high-tech bubble,” the researchers found that the tech poles with the highest concentrations of high-tech employment -- high technology, professional and technical services, information industries and manufacturing -- were the most adversely affected. The high-technology employment concentration finding indicates that tech poles can benefit from diversification outside high technology,” according to the researchers.

### **Diversity In High-Technology Employment**

The research findings also suggest that diversification within high technology can be beneficial, according to the authors. “During the most recent recession, concentration of employment in one particular industry within high tech in an MSA (regardless of the particular industry in high tech) tended to have negative effect on the MSA economy and contributed to pronounced employment percentage decline,” according to the researchers.

### **Information Industry Concentration**

Metropolitan areas with high concentrations in the information industry suffered in the recent recession. As examples, Seattle, Dallas, and New York City all had information concentrations around 5 percent (compared to the 25 top tech pole median of 3.1 percent) and these MSAs all lost approximately 5 percent of total employment between March 2001 and March 2003, the researchers found.

### **Average Wages In All Industry**

“Many public officials and community advocates in technology centers have been most concerned with high-tech wages and, in particular, whether or not wages in other industries are keeping up with high-tech wages. The finding with regards to the effect of wage levels in

technology centers during the early 2000s suggests that liveable wage legislation that increases metropolitan area average all industry wages might have unintended consequences. It has the potential to hurt those that it is intended to help. Our findings suggest that policies that raise overall wages in tech poles can contribute to pronounced employment decline during economic downturns,” the researchers said.

Counter to some of the recent literature on regional development and knowledge-based industry clustering and networking, the researchers found the rules of regional economic development have not changed dramatically with the new economy. “High-technology regions, just as ‘traditional’ industry regions over the past century, are vulnerable to pronounced economic cycles of growth and decline. The cycles can be particularly pronounced if regional economies are not well diversified and labor costs are not moderated during economic downturns,” according to the authors.